

# A New Deep-sea Limpet of the Genus *Pectinodonta* Dall, 1882 from New Zealand, and New Distribution Records for *P. aupouria* and *P. morioria* Marshall, 1985 (Gastropoda: Acmaeidae)

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## ABSTRACT

*Pectinodonta marinovichi* n. sp. is described and illustrated, and new distribution data are provided for *P. aupouria* Marshall, 1985 and *P. morioria* Marshall, 1985.

**Key words:** Mollusca, Acmaeidae, *Pectinodonta*, deep-sea, new species, New Zealand

## INTRODUCTION

Since the discovery of two Recent *Pectinodonta* species in the New Zealand region (Marshall, 1985), a third species has been recognized, and considerable additional material of the other two species has come to hand. The opportunity is taken to record this additional material and to plot the distributions. Note that New Zealand *Pectinodonta* species have only been found in areas that have been extensively worked by commercial trawlers, so their true distributions are likely to be more extensive than implied by the distribution maps presented here (Figures 6–8). Acronyms: NMNZ, Museum of New Zealand, Wellington; NZOI, National Institute of Water and Atmospheric Research, Wellington.

## SYSTEMATICS

Superfamily Acmaeoidea Forbes, 1850  
Family Acmaeidae Forbes, 1850  
Subfamily Pectinodontinae Pilsbry, 1891  
Genus *Pectinodonta* Dall, 1882

*Pectinodonta* Dall, 1882: 409. Type species (by original designation): *Pectinodonta arcuata* Dall, 1882; Recent, Caribbean.

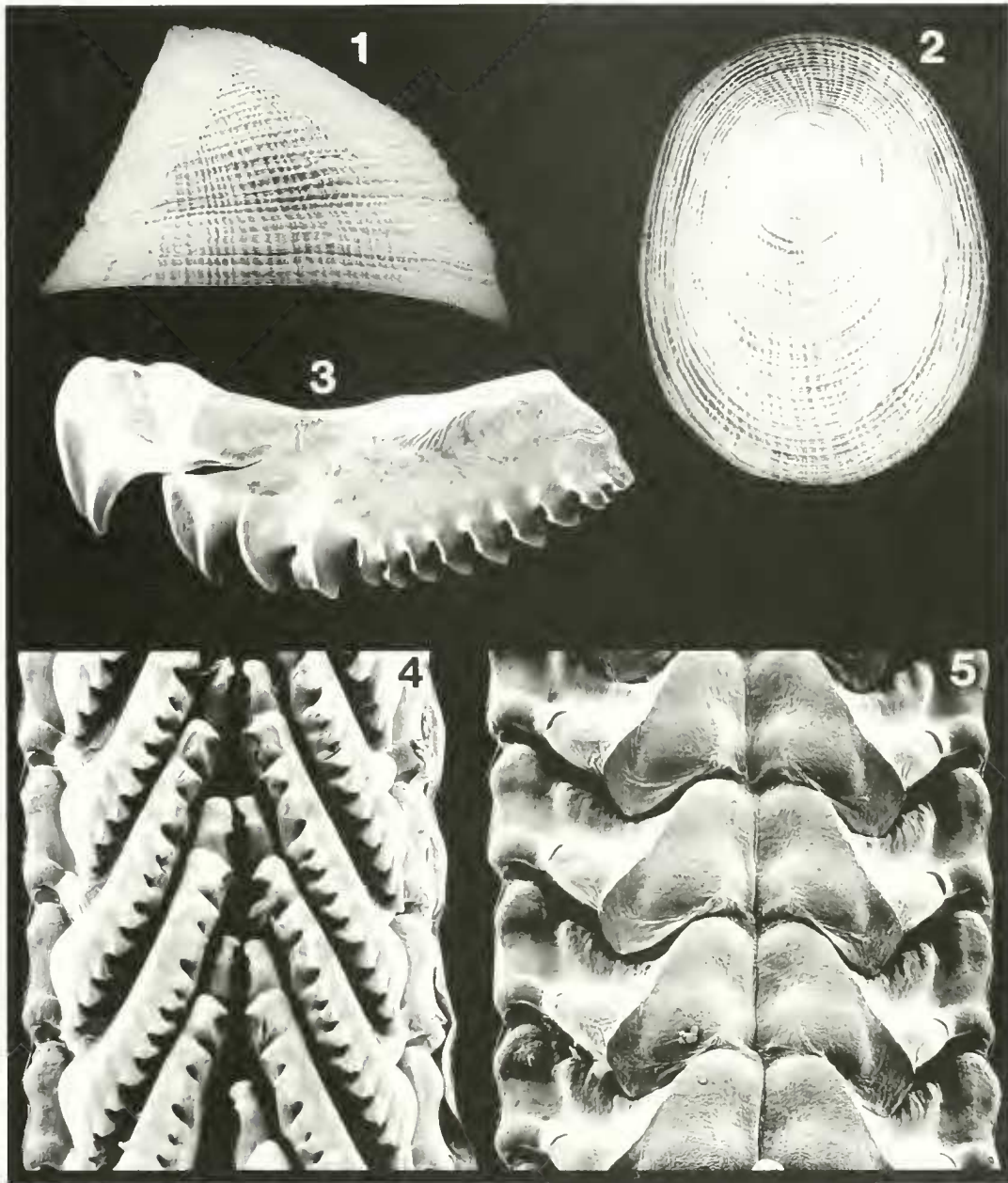
**Remarks:** Lindberg (1986) redefined Acmaeidae, restricted it to include *Acmaea mitra* Rathke, 1833 (Acmaeinae) and *Pectinodonta* species (Pectinodontinae) alone, and referred most other taxa hitherto referred

there to Lottiidae. More recently Okutani *et al.* (1992) have introduced two new genera (*Serradonta* and *Bathycymaca*) for pectinodontines with highly distinctive radulae that live on vestimentiferan tubes and *Calyptogena* valves from a bathyal cold seep in Sagami Bay, Japan. Worldwide Recent and Tertiary *Pectinodonta* species were listed by Marshall (1985). Lindberg and Hedegaard (1996) discussed pectinodontine shell structure, recruitment patterns and phylogenetic relationships.

*Pectinodonta marinovichi* new species  
(Figures 1–6)

*Pectinodonta aupouria* Marshall, 1985: 277 (in part; largest measured paratype).

**Description:** Shell (Figures 1, 2) up to 25.4 mm long, strongly arched, of moderate thickness, white, exterior dull, interior porcellanous. Anterior end occupying 20–31 % of shell length; anterior slope weakly concave in most specimens, in others almost flat or weakly convex; posterior slope rather strongly convex; lateral slopes weakly convex. Aperture elliptical, shallowly or very shallowly concave from side to side, sides broadly rounded, anterior end more broadly rounded than posterior. With growth, shell gradually twisting clockwise about 10° between juvenile and adult. Teleoconch at 1.6–1.8 mm length translucent and glossy, smooth apart from very fine growth lines; fine radial lines show through outer shell layer but do not resolve as surface features. Subsequent teleoconch chalky white, with low, rounded radial ribs, interspaces wider than each rib; and stronger, rounded or roundly angulate concentric ridges. Fine, crowded, concentric growth lines throughout. Myostracum clearly defined. Animal with eyes lacking. Foot and mantle edge cream white. Large, tapered ctenidium extending antero-laterally from left to right behind head. Mantle edge weakly and irregularly serrate. Muzzle lap-



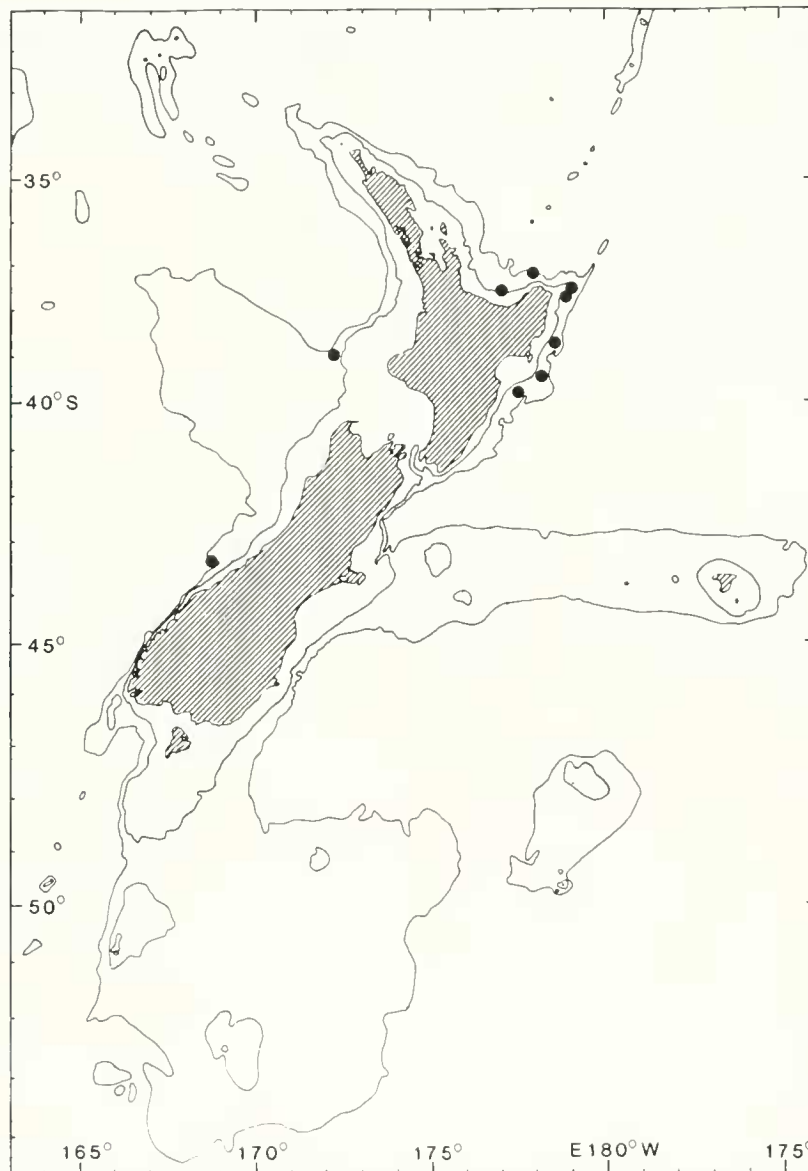
**Figures 1–5.** *Pectinodonta marinovichii* new species **1, 2.** Holotype, off Cape Kidnappers, 1100 m, length 25.4 mm. **3–5.** Radula of holotype. **3.** Inner side of single tooth (length 370  $\mu$ m). **4.** Part of radular ribbon showing teeth *in situ* attached to basal plates (width 330  $\mu$ m). **5.** Part of radular ribbon showing basal plates from which teeth have been removed (shrinkage is minimal) (width 370  $\mu$ m).

pets thin, broad. Cephalic tentacles small, circular in section, tapered, tips rounded. Radular ribbon about 40% longer than shell. Radular formula 0+3+0+3+0, each tooth (as defined here) comprising 3 fused laterals, individual units of which are defined by fine grooves (Figures 3–5). Teeth arranged in a posteriorly diverging V-shape; each with 13 or 14 conical cusps, innermost cusp largest, next 3 cusps smaller, outer cusps yet smaller and similar.

**Type data:** Holotype, NMNZ M.127085 (length 25.4

mm, width 19.4 mm, height 15.0 mm) and 3 paratypes, NMNZ M.127023: Off Cape Kidnappers, 39° 50' S, 177° 39' E, alive on wood with *P. aupouria*, 1100 m, 10 August 1995, F.V. Petersen, coll. M. Marinovich.

**Other material examined:** Off White Island, Bay of Plenty, New Zealand, 37° 23.7' S, 177° 39.5' E, alive on wood together with *P. aupouria*, 1075–1100 m, 23 November 1981, coll. O.M. Moore and P.J. McMillan, F.V. Kalinovo (stn. KO1/19/81) (3, NMNZ M.126299); off East Cape, 37° 32.6' S, 179° 19.3' E, alive on wood with



**Figure 6.** Map of New Zealand showing distribution of *Pectinodonta marinovichi* new species: 200 and 1000 m isobaths indicated.

*P. aupouria*, 1280–1215 m, 4 August 1974, R.V. *Tangaroa* (2, NZOI, stn. K873/2); N of Cape Runaway, 37° 19.46' S, 178° 01.16' E, alive on wood with *P. aupouria*, 1124–1169 m, 14 May 1995, F.R.V. *Tangaroa* (stn. 9506/12) (1, NMNZ M.126152); off East Cape, 37° 47.95' S, 179° 04.35' E, alive on wood, 1289–1364 m, 23 March 1993, F.R.V. *Tangaroa* (stn. 9303/57) (33, NMNZ M.118799); off Gisborne, 38° 49.14' S, 178° 34.81' E, alive on wood, 736–760 m, 25 March 1993, F.R.V. *Tangaroa* (stn. 9303/69) (6, NMNZ M.117958); off Cape Egmont, 38° 58.5' S, 172° 10.2' E, alive on wood, 1045–1055 m, 3 June 1986, F.V. *Wanaka* (stn. WK5/17/86) (1, NMNZ M.86819); off Mahia Peninsula, 39° 25.7' S, 178° 25.3' E, alive on wood, 921–939 m, 24 June 1986, F.V. *Otago Galliard* (stn. OG2/31/86) (20, NMNZ

M.126569); off Hokitika, 43° 27' S, 168° 47' E, alive on wood, 910–987 m, 17 May 1985 (3, NMNZ M.118017).

**Distribution (figure 6):** Off White Island to off Hokitika, New Zealand, living and feeding on wood, 736–1364 m.

**Remarks:** *Pectinodonta marinovichi* attains larger size than *P. aupouria* and smaller size than *P. morioria* (length up to 25.4 mm against 18.2 mm and 14.7 mm respectively). It differs further from both these species in that the radial ribs are much narrower, and the interspaces are broader than each rib instead of much narrower. The anterior slope is weakly concave in most of specimens of *P. marinovichi*, but convex in most specimens of *P. aupouria*. The mantle edge is more weakly

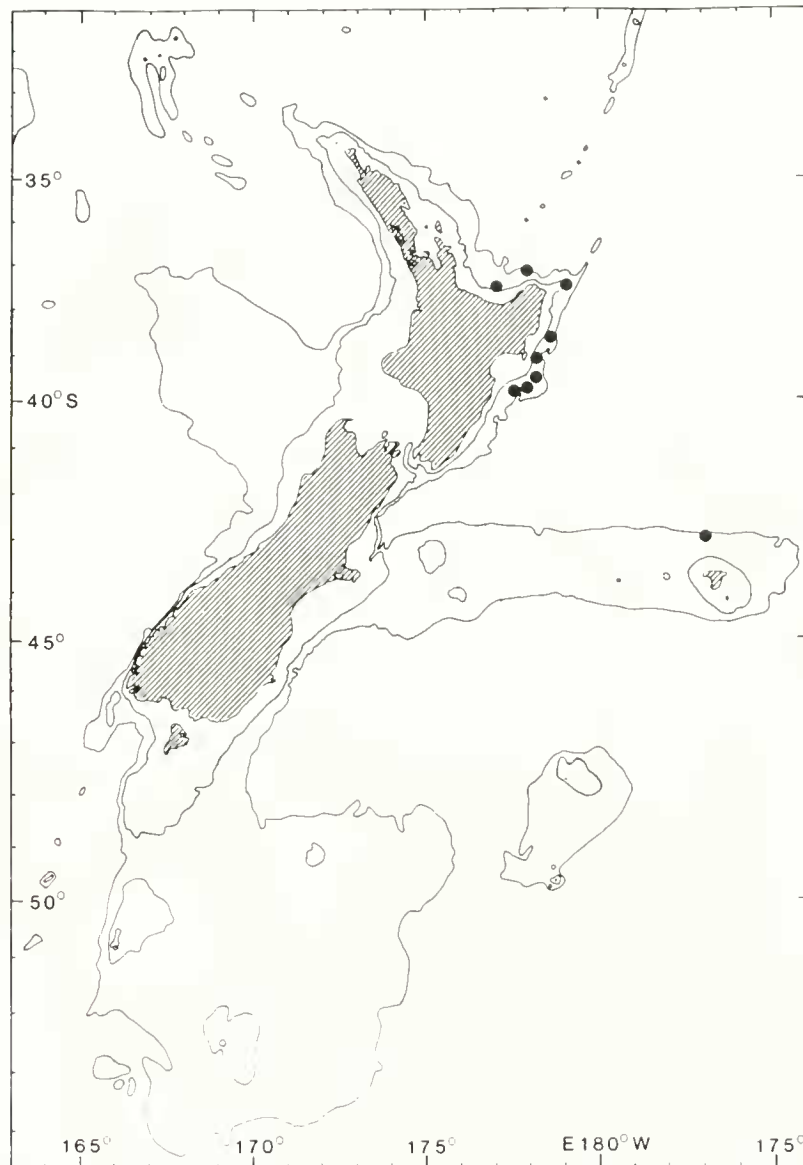


Figure 7. Map of New Zealand showing distribution of *Pectinodonta aupouria* Marshall, 1985: 200 and 1000 m isobaths indicated.

serrate than in *P. aupouria*. The radula resembles that of *P. aupouria* and has more numerous cusps than that of *P. morioria*. *P. marinovichi* has been taken twice living together on the same piece of wood as *P. aupouria*. Three specimens of *P. marinovichi* were found among the 1232 paratypes of *P. aupouria* Marshall, 1985, the largest of which (length 20.2 mm) was unfortunately included in a table of shell measurements for that species (Marshall, 1985, Table 1).

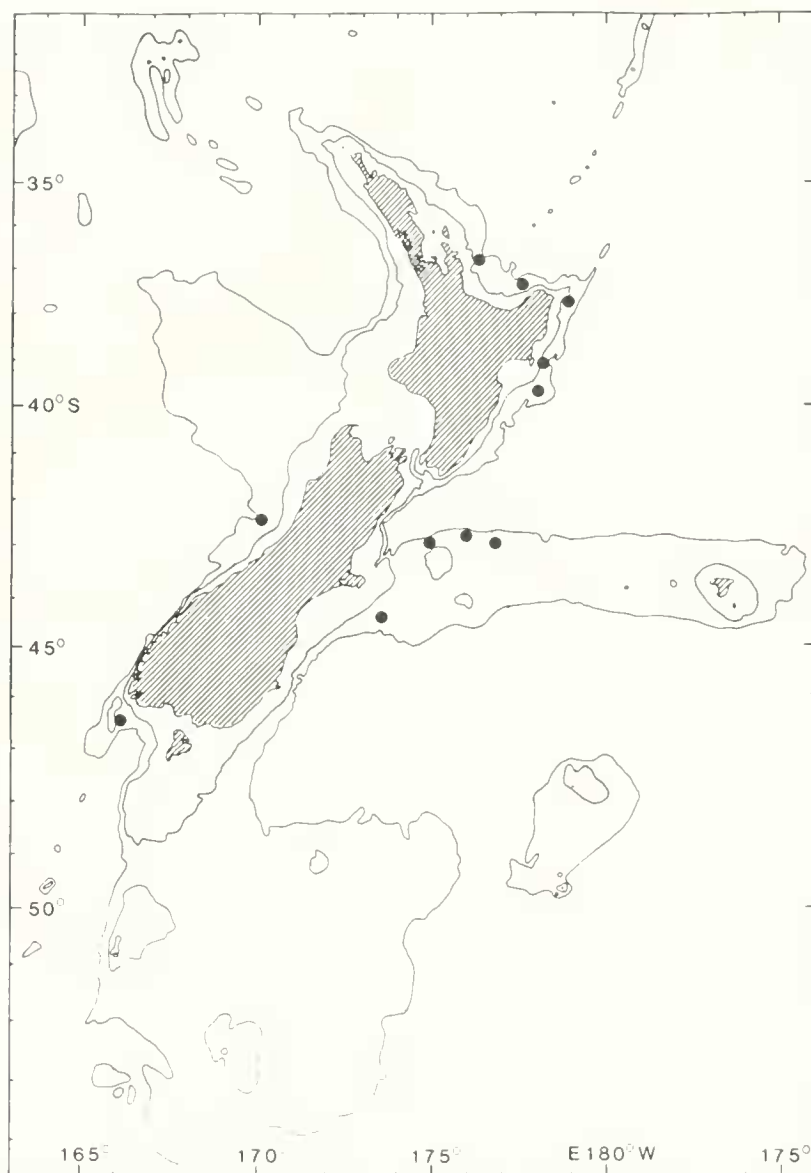
**Etymology:** After Miro Marinovich, F.V. Petersen (Simunovich Fisheries, Auckland), who collected the holotype and who has acquired tremendous quantities of bycatch for the Museum of New Zealand.

*Pectinodonta aupouria* Marshall, 1985  
(Figure 7)

*Pectinodonta aupouria* Marshall, 1985: 277, fig. 1, 3F-1, 4A.  
D (in part; largest paratype = *P. marinovichi* n. sp.; specimen identified by Powell (1979) as *Maoricrater explorata* = *P. morioria*).

**Type data:** Holotype, M.76089 and 1229 paratypes, NMNZ; Off White Island, Bay of Plenty, New Zealand, 37° 23.7' S, 177° 39.5' E, alive on wood together with *P. marinovichi* n. sp., 1075–1100 m, 23 November 1981, coll. O.M. Moore and P.J. McMillan, F.V. Kalinovo (sta. KOI/19/81).

**Other material examined:** N of Cape Runaway, 37°



**Figure 8.** Map of New Zealand showing distribution of *Pectinodonta morioria* Marshall, 1955: 200 and 1000 m isobaths indicated

19.46' S, 178° 04.16' E, alive on wood with *P. marinovichi*, 1124–1169 m, 14 May 1995, F.R.V. *Tangaroa* (stn. 9506/42) (1, NMNZ M.126151); off East Cape, 37° 32.6' S, 179° 19.3' E, alive on wood with *P. miranovichi* n. sp., 1280–1215 m, 4 August 1974, R.V. *Tangaroa* (9, NZOI stn. KS73/2); off Gisborne, 38° 39.00' S, 178° 43.5' E, alive on wood, 885–1000 m, 17 October 1988, F.R.V. *James Cook* (stn. J12/45/88) (14, NMNZ M.92452); off Mahia Peninsula, 39° 05' S, 178° 10' E, alive on wood with *P. morioria*, 900–1000 m, June 1994, coll. M. Marinovich, F.V. *Petersen* (25, NMNZ M.118319); E of Mahia Peninsula, 39° 24.64' S, 178° 27.68' E, alive on wood, 1271–1352 m, 25 March 1993, F.R.V. *Tangaroa* (stn. 9303/73) (30, NMNZ M.117964); off Cape Kidnappers, 39° 42.91' S, 178° 10.15' E, alive on wood with *P. morioria*, 818–952 m, 8 June 1993, coll.

M. Clark, F.R.V. *Tangaroa* (stn. 9306/210) (4, NMNZ M.117997); off Cape Kidnappers, 39° 50' S, 177° 39' E, alive on wood with *P. marinovichi*, 1100 m, 10 August 1995, F.V. *Petersen*, coll. M. Marinovich (18, NMNZ M.127022); N of Chatham Islands, 42° 45.37' S, 177° 09.74' W, alive on wood, 1064–1067 m, 23 July 1994, F.R.V. *Tangaroa* (stn. 9406/383) (16, NMNZ M.118817).

**Distribution (figure 7):** White Island to off Cape Kidnappers, north-eastern North Island, and off Chatham Islands, New Zealand, living and feeding on wood, 818–1280 m.

**Remarks:** In the original description of *Pectinodonta anpouria* I stated that the shell attains a length of 20.2 mm. This measurement, however, refers to a specimen of *P. marinovichi*, which was included with the type ma-

terial, and the largest specimen of *P. aoupouria* seen (a paratype) is 15.2 mm long. I was also mistaken in concluding that the *Pectinodonta* species misidentified by Powell (1979) as "*Notocrater explorata* Dell, 1953" (a lepetid) was *P. aoupouria*, for examination of the actual specimen reveals that it is *P. morioria*. *P. aoupouria* has been taken alive on two occasions with *P. morioria* and on four occasions with *P. marinovichii*.

*Pectinodonta morioria* Marshall, 1985  
(Figure 8)

*Maoricrater explorata*—Powell, 1979: 50, fig. 5: 1, 2 (not *Notoacmea explorata* Dell, 1953).

*Pectinodonta aoupouria* Marshall, 1985: 277 (in part, Powell's (1979) record as *Maoricrater explorata* only)

*Pectinodonta morioria* Marshall, 1985: 279, fig. 3J, K, 4B, E.

**Type data:** Holotype, NMNZ M.76090 and many paratypes, NMNZ M.75107: NE of Mernoo Bank, Chatham Rise, New Zealand, 42° 43.9' S, 176° 08' E, alive on wood, 800–810 m, 28 September 1982, F.V. *Kaltan* (KTN/152/82). Paratypes (4, NMNZ M.75242): Off Timaru, 44° 33.2' S, 173° 42.3' E, alive on wood, 750–738 m, 8 June 1984, F.R.V. *James Cook* (stn. J10/4/84).

**Other material examined:** Off Aldermen Islands, 366–476 m, on wood (1, Auckland Institute and Museum AK131610); off Aldermen Islands, alive on wood, 400 m, April 1988, pres. D. Gibbs (2, NMNZ M.95302); off Cape Runaway, 37° 29.9' S, 177° 47' E, alive on wood, 450–481 m, 5 December 1985, F.V. *Wanaka* (stn. WK3/19/85) (ca. 1000, NMNZ M.84252); off East Cape, 37° 47.64' S, 179° 04.45' E, alive on wood, 1289–1342 m, 24 March 1992, F.R.V. *Tangaroa* (stn. 9203/133) (27, NMNZ M.117898); off Mahia Peninsula, 39° 05' S, 178° 10' E, alive on wood with *P. aoupouria*, 900–1000 m, June 1994, coll. M. Marinovich, F.V. *Petersen* (18, NMNZ M.118321); off Cape Kidnappers, 39° 42.91' S, 178° 10.15' E, alive on wood with *P. aoupouria*, 818–952 m, 8 June 1993, coll. M. Clark, F.R.V. *Tangaroa* (stn. 9306/210) (several hundred, NMNZ M.117996); off Hokitika, 42° 37.6' S, 170° 02.8' E, alive on wood, 490–439 m, 13 October 1988, F.V. *Diashin Maru* 22 (stn. 269/24) (several hundred, NMNZ M.92467); slope of Mernoo Bank, Chatham Rise, 42° 58.06' S, 175° 01.03' E, N alive on wood, 545 m, 15 January 1992, F.R.V. *Tangaroa* (stn. 9106/91) (many hundreds, NMNZ M.126570); E of Mernoo Bank, Chatham Rise, 42° 53'–43° 08' S, 176° 04'–177° 00' E, alive on wood, 370–420 m, December 1994, coll. M. Marinovich, F.V. *Petersen* (50, NMNZ M.119153); off Puysegur Point, 46° 29' S, 166° 14' E,

alive on wood, 560 m, 20 October 1987, F.V. *Chiyo Maru* 5 (52, NMNZ M.90196).

**Distribution (figure 8):** Aldermen Islands to off Puysegur Point, New Zealand, living and feeding on wood, 366–1342 m.

**Remarks:** *Pectinodonta morioria* proves to attain a shell length of 14.7 mm, which is considerably larger than the type material (length of largest paratype 8.30 mm). Apart from smaller size, *P. morioria* differs from *P. aoupouria* in having more numerous radial ribs, rounded instead of adapically shelved concentric ribs, finer, more numerous cusps on the radular teeth, and a smooth instead of serrate mantle edge. *P. morioria* and *P. aoupouria* have been taken living together on the same piece of wood on two occasions.

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